

FIG. 1A

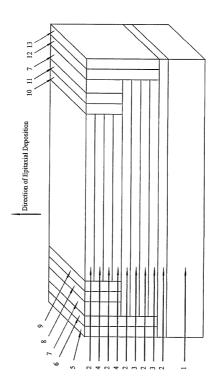


FIG. 1B

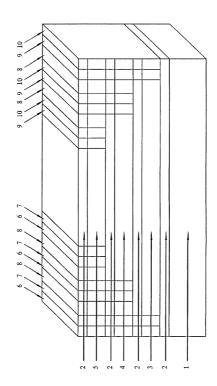


FIG. 2A

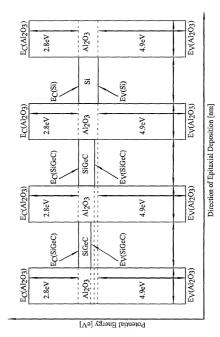
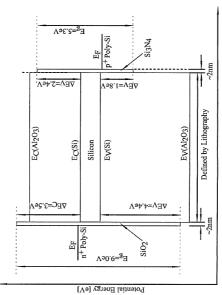


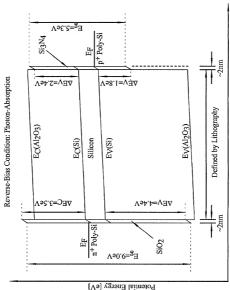
FIG. 2B

Flat-Band Condition: no photon absorption nor emission



Direction Parallel to QW Potential Barrier (x,y plane) [nm]

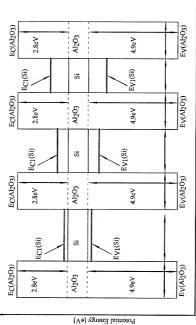
FIG. 2D



Direction Parallel to QW Potential Barrier (x,y plane) [nm]

FIG. 3A

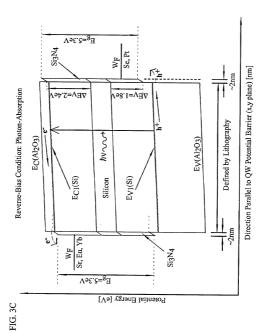
Title: WAVELENGTH-SELECTIVE PHOTONICS DEVICE Inventor(s): C. Augusto Docket No.: VAN-109

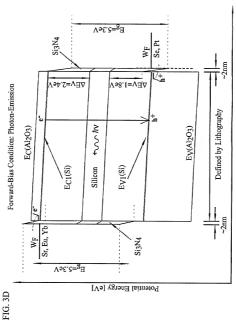


Direction of Epitaxial Deposition [nm]

Eg=5.3eV Si3N4 Se, Pt Flat-Band Condition: no Photon-Absorption nor Emission Λ54.Δ=V∃Δ V98.1=V∃∆ Defined by Lithography ΛΕΛ=2.3eV Λ5ε.2=γ∃Δ EC(Al203) Silicon ECI(Si) EV<sub>1</sub>(Si) Eg=5.3eV Potential Energy [eV]

Direction Parallel to QW Potential Barrier (x,y plane) [nm]





Direction Parallel to QW Potential Barrier (x,y plane) [nm]

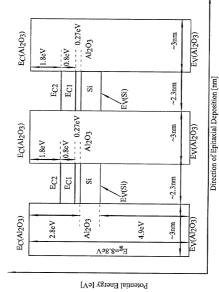
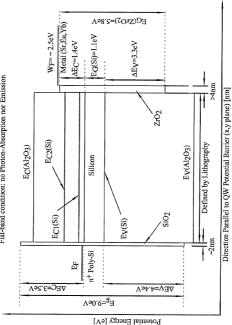


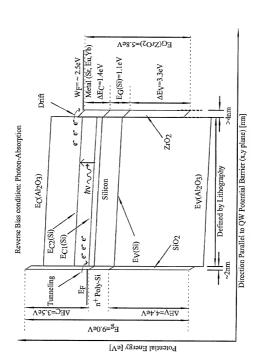
FIG. 4A

Flat-band condition: no Photon-Absorption nor Emission

FIG. 4B







Title: WAVELENGTH-SELECTIVE PHOTONICS DEVICE Inventor(s). C Augusto Docket No.: VAN-109

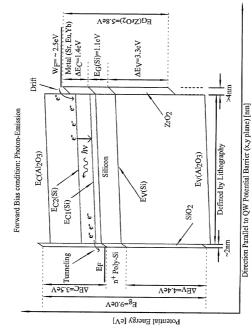


FIG. 41

Al<sub>2</sub>O<sub>3</sub> ~0.6eV ~1.8eV ~2.5eV Ec(Al<sub>2</sub>O<sub>3</sub>) Ev(Al<sub>2</sub>O<sub>3</sub>) ~3nm Ec(SiGeC) ~1.6nm SiGeC EV2 EVI Al<sub>2</sub>O<sub>3</sub> ~2.4eV ~1.7eV E<sub>C</sub>(Al<sub>2</sub>O<sub>3</sub>) ~0.8eV Ev(Al<sub>2</sub>O<sub>3</sub>) ~3nm Ec(SiGeC) SiGeC ~1.4nm E<sub>V2</sub> EVI Al<sub>2</sub>O<sub>3</sub> ~1.0eV ~3.0eV ~0.9eV Ec(Al<sub>2</sub>O<sub>3</sub>) E<sub>V</sub>(Al<sub>2</sub>O<sub>3</sub>) ~3nm Ec(SiGeC) ~1.25nm SiGeC  $Ev_2$  $E_{V1}$ Ec(Al<sub>2</sub>0<sub>3</sub>)  $Al_2O_3$  $E_V(Al_2O_3)$ 2.8eV 4.9eV ~3nm Eg=8.8eV

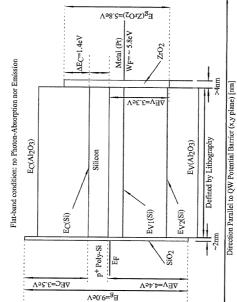
Potential Energy [eV]

Title: WAVELENGTH-SELECTIVE PHOTONICS DEVICE Inventor(s)' C. Augusto Docket No.: VAN-109

Direction of Epitaxial Deposition [nm]

Title: WAVELENGTH-SELECTIVE PHOTONICS DEVICE Inventor(s): C. Augusto Docket No.: VAN-109

FIG. 5B



Potential Energy [eV]

FIG. 5C

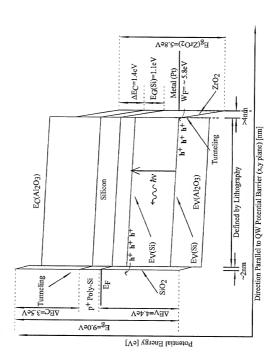
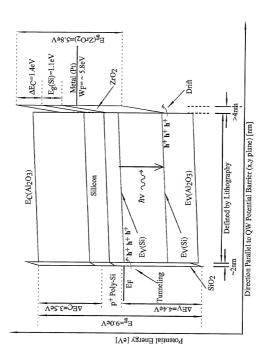
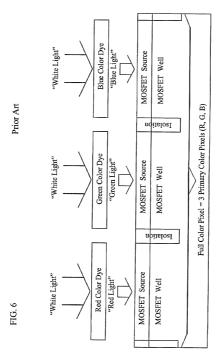
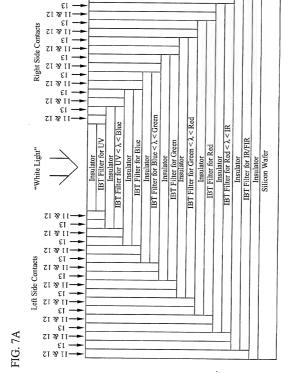


FIG. 5D





11 & 12 ← 13 ← 13 ← 11 & 12



White Light (Photons of all wavelengths)

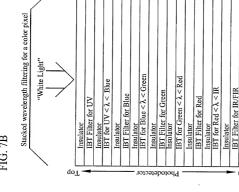
· OA < y < B Blue (B)

B < y < G

. IR — Стееп (G)

- G < λ < R

- Green (G)



Band-Gap

Direction of Epitaxial Deposition

Band-Gap Magnitude

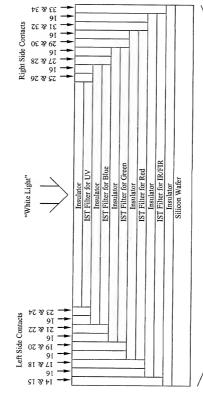
Narrower

Silicon Wafer

nsulator

Bottom

}



Area of Single Full Color Pixel (  $\lambda_{UV}$ , R, G, B,  $\lambda_{IR}$  ) = Area of 1 Primary Color Pixel

FIG. 7C

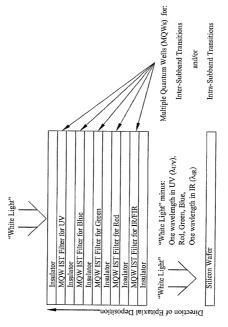
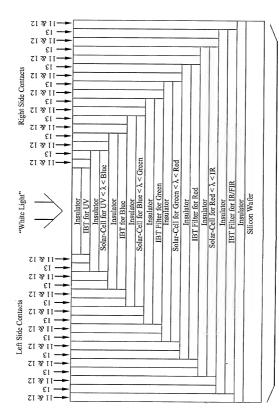


FIG. 8A





Area of Single Full Color Pixel (λυν, R, G, B, ληκ ) = Area of 1 Primary Color Pixel

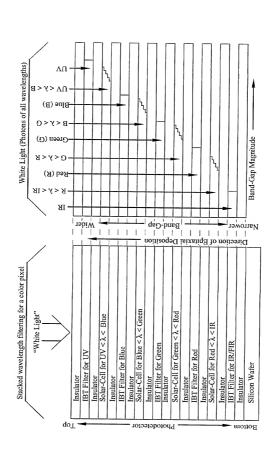
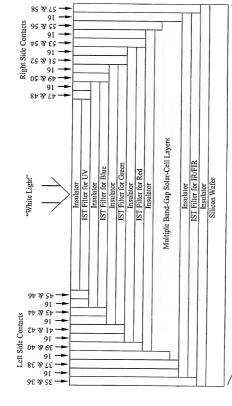


FIG 8D



Area of Single Full Color Pixel ( Auy, R, G, B, Air ) = Area of 1 Primary Color Pixel

Figure 8E

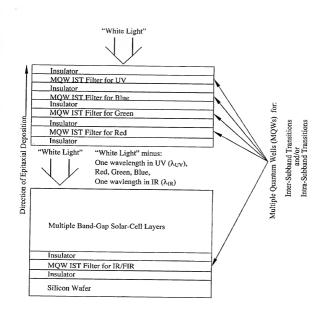
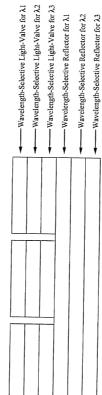


FIG. 9A

Multi-Spectral Pixel



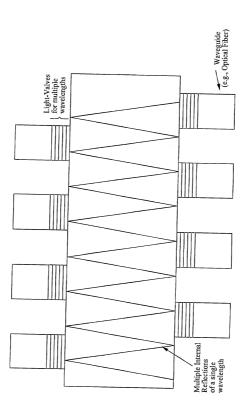


FIG. 9B